

TRANSACTIONS
OF
THE ZOOLOGICAL SOCIETY
OF LONDON.

I. *On the Genus Urothoe and a new Genus Urothoides.*
By the Rev. THOMAS R. R. STEBBING, M.A.

Received July 16th, 1889, read November 5th, 1889.

[PLATES I.-IV.]

Genus UROTHOE, Dana, 1852.

1852. *Urothoe*¹, Dana, American Journ. Sci. and Arts, ser. 2, vol. xiv. p. 311.
1852. „ Dana, United-States Explor. Exped. vol. xiii. pt. 2, pp. 908, 920.
1853. *Egidia*, Costa, Rendiconto d. Soc. r. Borb. Acad. d. Scienze, p. 165.
1856. *Ganmarus* (pars), Spence Bate, On the British Edriophthalma, Brit. Assoc. Report for 1855.
1857. *Egidia*, Costa, Ricerche sui Crost. Amfip. Nap. pp. 174, 190.
1857. *Sulcator* (pars), Spence Bate, Synopsis of British Edr. Crust., Ann. & Mag. Nat. Hist. ser. 2, vol. xix. p. 140.
1857. „ (pars), White, Popular Hist. Brit. Crust. p. 175.
1857. *Urothoe*, Spence Bate, Synopsis of British Edr. Crust., Ann. & Mag. Nat. Hist. ser. 2, vol. xix. p. 145.
1857. „ White, Popular Hist. Brit. Crust. p. 186.
1860. „ Boeck, Forhandlinger ved de Skand. Naturf. 8de Møde, p. 646.
1862. „ Spence Bate, Brit. Mus. Catal. Amph. Crust. p. 114.
1862. „ Bate & Westwood, British Sess. Crust. vol. i. p. 192.
1865. „ Lilljeborg, On *Lysianassa magellanica*, p. 18.
1869. „ Grube, Mitth. über St. Vaast-la-Hougue, Abhandlungen der schlesischen Gesellschaft für vaterländische Cultur, 1868-9, p. 119.
1869. „ Norman, Last Report on Dredging among the Shetland Isles, Brit. Assoc. Report for 1868, p. 279.

¹ The name is variously printed in different works as *Urothoe*, *Urothöe*, and *Urothoè*.

1870. *Urothoe*, Boeck, Crust. amph. bor. et arct. p. 57.
 1876. „ Boeck, De Skand. og Arkt. Amph. p. 224¹.
 1876. „ Giard, Comptes Rendus, Jan. 3, p. 76; Ann. & Mag. Nat. Hist. ser. 4, vol. xvii. p. 261.
 1876. „ Stebbing, Ann. & Mag. Nat. Hist. ser. 4, vol. xvii. p. 344.
 1877. „ Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 107.
 1878. „ Spence Bate, the Crustacea in Couch's Cornish Fauna revised, Journ. Roy. Inst. Cornwall, no. xix. pt. ii. p. 48.
 1879. „ Sars, Crust. et Pycn. nova, p. 446.
 1879. „ Stebbing, Sessile-eyed Crustacea of Devonshire, Suppl. List, Trans. Devon. Assoc. vol. xi. p. 519.
 1882. „ Haswell, Catal. Australian Stalk- and Sessile-eyed Crustacea, p. 240.
 1882. „ Sars, Oversigt af Norges Crustaceer, p. 22.
 1884. „ Chevreux, Assoc. pour l'av. des Sciences, Blois.
 1885. *Egidia*, Carus, Prodrömus Faunæ Mediterraneæ, pars ii. p. 419.
 1885. *Urothoe*, Sars, Den norske Nordhavs-Exped. p. 164.
 1886. „ Gerstæcker, Bronn's Klassen und Ordnungen, Bd. v. Abth. ii. p. 501.
 1887. „ Barrois, Note sur Morph. des Orehesties et liste Amph. du Boulonnais, p. 16.
 1887. „ Bonnier, Catal. Crust. Malæ. Concarneau, p. 79.
 1887. „ Chevreux, Crust. Amph. dragués par l'*Hirondelle*, Bull. Soc. Zool. de France, t. xii. extr. pp. 13, 15.
 1887. „ Chevreux, Catal. Crust. Amph. Bretagne, Bull. Soc. Zool. de France, t. xii. extr. p. 10.
 1888. „ Chevreux, Distr. géogr. Amph. sur les côtes de France, Bull. Soc. d'études Sci. de Paris, 11^e année, 1^{er} sem. 1888, extr. pp. 2, 7.
 1888. „ Chevreux, Amph. du littoral des Açores, Bull. Soc. Zool. de France, t. xiii. p. 34.
 1888. „ Chevreux, Dragage de l'*Hirondelle* au large de Lorient, Bull. Soc. Zool. de France, t. xiii. séance du 28 février.
 1888. „ Chevreux, Amph. réc. aux environs de Cherchell, Assoc. pour l'av. des Sci. Oran, séance du 3 avril.
 1888. „ Robertson, Catal. Amph. and Isop. Clyde, p. 29.
 1888. „ Stebbing, Challenger Reports, vol. xxix. p. 824.

Upper lip distally rounded, strongly attached to the mandibles.

Mandibles having the cutting-edge scarcely denticulate, the secondary plate small, spine-row wanting, the molar tubercle strong, all three joints of the palp slender and rather elongate.

First maxillæ with inner plate slender, curved, the two joints of the palp subequal.

Maxillipeds with inner and outer plates of only moderate size, the second joint of the palp large and dilated, the third joint apically dilated, the fourth narrow.

Upper antennæ with a secondary flagellum; the three joints of the peduncle moderately elongate, not very unequal in length, together longer than the few-jointed flagellum.

¹ In the first part of this work (1872) at p. 56, Boeck refers to Costa's *Egidia* as *Aegidia*.

Lower antennæ. Peduncle spinous; the flagellum in the male very long, and multi-articulate, in the female very short, two-jointed; calceoli present in the adult male both on the flagellum and on the last joint of the peduncle.

First and second gnathopods similar, subchelate, the wrist larger than the hand; the finger of the *first gnathopod* longer than that of the *second*, each having a little transparent cap over the tip.

First and second peræopods having the third joint longer than the strongly spined fourth or fifth.

Third peræopods with the first, third, and fourth joints dilated, the third, fourth, and fifth strongly spined, and furnished with long plumose setæ; the fourth joint as wide as or wider than the third.

Fourth peræopods the longest, with long plumose setæ on the first and third joints. In all the *peræopods* the finger has the inner margin more or less nodulous or serrulate and has a cap over the tip.

Pleopods having the inner ramus conspicuously shorter than the outer, and in the female the peduncle distally widened.

Third uropods. The outer ramus furnished with a small second joint.

Telson in general cleft nearly to the base.

Body generally obese, not much either depressed or compressed; the side-plates not very large. Gland-cells are distributed in great numbers over different parts of the animal.

In this genus the *eyes* are very variable; in some, if not in all, species the eyes, though very large in the male, are of moderate size in the female, and very small in the young. In *Urothoe abbreviata*, Sars, no eyes were observed; but the specimen being very small and probably young, it cannot be inferred with certainty that this is a blind species. The second joint of the mandibular palp forms an angle or bend near its base, owing to which its full length is sometimes not perceived. The inner plate of the first maxillæ appears to be always slender and slightly curved; the first joint of the palp seems to vary in its proportion to the second, to which it is sometimes equal, while in other cases it may be longer or shorter than it. Boeck has remarked that, when Dana attributed to this genus long and narrow maxillipeds with very small inner lamellæ, he was thinking only of his *Urothoe rostratus*, which belongs elsewhere. Spence Bate was perhaps influenced by Dana's account when describing the outer plates as small, and the inner as rudimentary; they are, in fact, both of moderate size. In most, and perhaps in all, species the wrist of the *first gnathopod* is distinguished from that of the *second* by having a row of short feathered setæ planted just within the distal margin. As a rule, there is an oblique row of setæ on the outer surface of the third and fourth joints of the first and second peræopods; long feathered setæ are attached to the inner distal margin of the third and fourth joints and to the inner surface of the fifth joint in the *third peræopods*, also to the inner surface of the

first joint and the hind margin of the third joint in the *fourth peræopods*, also to the inner surface on the lower part of the second pleon-segment, and to the rami of the *third uropods*.

There have been at various times assigned to this genus twelve named species, one unnamed species, and one named variety. Four of the species have their proper places in other genera. *Urothoe rostratus*, Dana, 1852, from the Sooloo Sea, was transferred by Boeck in 1876 to *Phoxus* (now *Phoxocephalus*); and whether it belongs to that genus or not, it is certainly excluded by the maxillipeds from *Urothoe*. In 1874 Professor S. I. Smith recorded "*Urothoë*, species," as "apparently belonging to this genus," from Vineyard Sound, N.E. America. This, however, proves to be a species of the genus *Harpinia*, Boeck. *Urothoë pinguis*, Haswell, 1880, from Bondi, New South Wales, also approaches the genus *Harpinia*, but is clearly removed from *Urothoe* by the upper antennæ, the maxillipeds, the gnathopods, and some other details. *Urothoe lachneëssa*, Stebbing, 1888, from Kerguelen, should be transferred to a new genus *Urothoides*, on account of the character of the fourth and fifth peræopods and the third uropods, as well as the absence of the plumose setæ, which are so conspicuous in the European species of *Urothoe*.

The type species, *Urothoe irrostratus*, Dana, 1852, had scarcely been published, when another species of the same genus appeared under the name *Egidia pulchella*, Costa, 1853, from the Bay of Naples. The fuller description of this species was given in 1857, and in 1872 Boeck pointed out that *Egidia* was a synonym of *Urothoe*. In the generic description Costa says that the lower antennæ have the first joint unarmed, doubtless meaning that there is no gland-cone; but this is a mistake, as the gland-cone, though inconspicuous, is present. It is clear both from the generic and specific characters that Costa confused some of the limbs, overlooking one of the first two pairs of peræopods altogether, and regarding the third pair as the second. In describing the third peræopods he also evidently overlooked the second joint, so that, although he gives a recognizable description and figure of the last four joints of the limb, he supposes the last of the four, the finger, to be entirely wanting. It is clear from the account of the lower antennæ that *Urothoe pulchella* was described from a male specimen. The eyes are stated to be large, rounded-triangular, nearly meeting on the back. The colour of the living animal was, according to Costa, pale green (*verdiccio pallido*). The prevailing colour in the genus is light buff, sometimes mottled with pink or rose-colour. Rose-coloured specimens procured from Naples by Dr. Norman must probably be assigned to *Urothoë elegans*, Bate. Other specimens from the same locality, not so coloured, agree well with Costa's species, though not having the hand of the second gnathopods produced into a tooth confronting the finger. This tooth may have been described and figured by Costa under a misapprehension owing to his having only had an oblique view of the little convex palm.

In 1856 Spence Bate published a third species of the genus under the name *Gammarus elegans*, which in 1857 he changed to *Urothoe elegans*. The type specimen from Plymouth was described in detail, and figured in the British-Museum Catalogue in 1862. Many of the characters given are common to other species. The long flagellum of the lower antennæ shows that the specimen was a male. The eyes are described as "nearly horizontal, long ovate," the palms of the gnathopods as "oblique, imperfectly defined, ciliated," the fingers of the peræopods as straight and sharp. In the fifth peræopods, it is said, "a few long plumose cilia mixed with short simple ones occur upon the posterior margins of the carpus and propodos." The first and second uropods are said to be short, with the "rami very short, shorter than their respective bases, subequal," while the third pair are, as usual, "long; rami longer than base, plumosely ciliated." In the figure the postero-lateral angles of the third pleon-segment are decidedly acute. In the 'British Sessile-eyed Crustacea' (1862) a figure of the species similar to that in the Catalogue is given, with a much shorter description. Here the authors think two "important points," the shape of the eyes and the size of the antennæ, sufficient to distinguish it from *Urothoe marinus*. "The rest of the animal," they say, "scarcely offers any specific variation from *U. marinus*." As the size of the antennæ is dependent on age and sex, the only character left for distinction is that of the eyes, which, the authors say, "are uniform." Since this has no meaning, it becomes a question whether the word intended may have been *reniform* or *oviform*. An explanation is given that the specific name was suggested by the extremely beautiful colouring,—whitish-buff, and parts mottled with pink,—but no stress is laid upon this as a specific character. The Scotch specimens of *Urothoe*, from the Clyde and the Shetland Isles, which make the nearest approach to this species, agree with Spence Bate's figure of it in not having the joints below the first in the third peræopods much dilated, and in having the corresponding joints in the two following pairs rather elongate; but no specimens that have come under my observation have the postero-lateral angles of the third pleon-segment acutely produced as in Spence Bate's figure of *Urothoe elegans*, or the second uropods with rami so very short. The discrepancies may be explained by the fact that no dissection of the specimen was made. This will account for the circumstance that the first and second peræopods are drawn with seven joints, the third only with five, and that no regard is paid to the long plumose setæ on the third and fourth peræopods.

In 1857, under the name of *Sulcator marinus*, Spence Bate published a species which in 1862 he figured and more fully described as *Urothoe marinus*, having received it from the Moray Firth, the Shetlands, and the Clyde. It was pointed out by Giard in 1876 that the brevity of the lower antennæ relied on as a specific character only indicated that the specimen examined was a female. In the description of these antennæ it is stated that the *first* joint of the peduncle is "furnished with three longitudinal rows of obtuse-pointed spines," and that the flagellum consists of a single joint; but that which by a

slip of the pen is called the *first*, is in reality the *fourth* joint of the peduncle, and it is surmounted by two, not three, rows of spines, although sometimes the spines of one row by lying over in opposite directions give the appearance of a double row. The flagellum consists of two joints, a long and a short one. The first pair of gnathopods are said to be much smaller than the second; but, while this would be unusual in the genus, there is a fairly certain proof that the gnathopods have been interchanged in the description, since the larger gnathopods are figured as having on the distal margin of the wrist the little row of spines which is distinctive of the first pair. It is true that both in the Museum Catalogue and in the 'British Sessile-eyed Crustacea' these gnathopods are figured with the branchial vesicle attached, which of course cannot belong to the first pair, and no doubt it was this apparent attachment of the breathing-organ which led to the confusion. The segments carrying the two pairs of gnathopods are in this genus so closely tied together, that the accident might easily arise of the second gnathopod being detached, while leaving its branchial vesicle in apparent connection with the first gnathopod. Of the crooked finger ascribed to the fifth peræopods I can give no account, except that it appears to be abnormal or accidental. The character most easy to seize for this species is to be found in the uropods, of which the first pair have a short peduncle and short unequal rami, the inner ramus being the shorter and much curved. In Spence Bate's figure the tips of these rami do not reach to the end of the short peduncle of the second pair, but in their natural position they reach much further than this, since the fourth pleon-segment much overlaps the fifth at the sides. The telson is accurately defined as "subapically furnished with a short spine and several fine hairs," but in no specimen that I have seen is it cleft quite to the base as in the figure. The length of the animal is said in the Museum Catalogue to be " $\frac{4}{20}$ ths of an inch;" but in the 'British Sessile-eyed Crustacea' we read " $\frac{1}{2}$ ²/₀ths of an inch," without any explanation of the change. In the latter work a line presumably indicating the natural size measures $\frac{6}{20}$ of an inch, and there can in fact be no doubt that $\frac{1}{2}$ ²/₀ is a misprint. Nevertheless *Urothoe marinus* is a much larger and more robust species than *Urothoe elegans*.

Urothoë norvegica, Boeck, 1860, from Norway, was the species next established. Figures and detailed description of it did not appear till 1876, and even with these the species is still left in some obscurity. It may be presumed from the small size of the lower antennæ that the specimen examined was a female¹; for, though Boeck states that the flagellum has four joints, an inspection of the figure makes it tolerably certain that there were actually no more than the usual two. Of the third pleon-segment Boeck makes two statements—one, that the postero-lateral angle is produced upwards, the other, that it is acute. His figure does not correspond with either particular. Of the third peræopods he remarks that the first joint is not much dilated. Specimens obtained by Canon Norman from "Sleat Sound, 1866," and "Shetland, 1867," agree with

¹ For a different opinion, see Chevreux on this species, 1887.

Boeck's description in having the angles of the third pleon-segment acute (though not produced upwards), and in having the first joint of the third peræopods rather less dilated than is usual in the genus, and with the lower hinder angle of the joint very much rounded. In Boeck's work, *De Skand. og Arkt. Amphip.* plate vii., fig. 4 *n* probably refers to these limbs, not, as the lettering would indicate, to the fifth peræopods. In describing the fifth peræopods he says that the fourth joint is longer and thicker than the *first*. *First* is obviously a misprint for *fifth*, a correction which brings the statement into agreement with Norman's specimens above referred to, and with Boeck's own figure of the limb, plate vi. fig. 9 *m*, where 9 *m* would indicate the third or the fourth peræopods, and is beyond doubt a mistake for 9 *n*. Plate vii. has two figures marked 4 *h*, as if representing the maxillipeds of *Urothoe norvegica*, but the upper one should probably be 5 *h*, referring to the species "*Phoxus Holbölli*;" in the lower one the first joint of the palp has been accidentally omitted. The figures 4 *g* and 4 *m* near the right-hand lower corner of the plate are most likely also wrongly numbered.

In 1862 Spence Bate described and figured under the title "*Urothoë Bairdii*, n. s.," a specimen obtained, like *Urothoe marinus*, from the Moray Firth. The lower antennæ show that the specimen was a male, but not a male which had attained its fullest development, so as to have calceoli and a very prolonged flagellum with very slender joints. Both in the Museum 'Catalogue' and in the 'British Sessile-eyed Crustacea' the maxillipeds are figured, evidently by mistake, without a finger; in the latter, but not in the former, work the lettering of the first and second pairs of uropods is transposed. The latter work affirms that the third peræopods "terminate in a knife-shaped finger, the anterior margin of which is entire," and the margin is so represented in both works, owing, I believe, to defective observation, since the denticulation of this margin may easily escape notice from some points of view, but has nevertheless proved to be present in all specimens of the genus that I have examined. It seems to me scarcely doubtful that *Urothoe Bairdii* is a synonym of *Urothoe marinus*. The peculiarity of having the outer ramus of the third uropods devoid of plumose setæ can scarcely be relied on of itself to constitute specific distinction. It can derive no validity from the sanction of a single, not fully developed, specimen. Boeck supposes *Urothoe Bairdii* to be a synonym of his own *Urothoe norvegica*; but in the former species the first joint of the third peræopods is very broad instead of being, as in Boeck's species, comparatively narrow, and the rami of the first uropods are very unequal, while in Boeck's species they are equal, so that there is really no question of uniting these two names.

In the same year (1862) Spence Bate established another species, upon a specimen one-tenth of an inch in length from Tenby, under the name *Urothoë brevicornis*, n. s. The specific name is unfortunate, since it is now known that the young and females in all species of the genus have the lower antennæ short, while they are long in the adult males. As in the case of *Urothoe marinus*, so here it is evident that the first and

second gnathopods have been confused, the larger first gnathopods with the spines on the apex of the wrist being figured and described as the second.

Professor Grube in 1869 described and figured a specimen from St. Vaast-la-Hougue under the title "*Urothoe marinus*, Sp. Bate, ? var. *pectinatus*, Gr." (in the explanation of the plate "*Urothoe marinus*, Sp. B. (? var. *pectina*, Gr.)." The account of the lower antennæ shows that the specimen was a female. Grube says that these antennæ have five joints, the second much longer than the first, armed above with a subtriple row of spines, the third simple, and armed with an outer row of rather long setæ, the flagellum very short, equalling the length of the third joint. The so-called second joint with the *subtriple* row of spines is evidently the fourth joint of the peduncle, the so-called third being the fifth, and the remaining two joints constituting the flagellum. He notices that the finger of the second gnathopods is shorter than that of the first. He would have been well content to assign the specimen to *Urothoe marinus*, Bate & Westwood, but for certain differences in the peræopods, especially the third pair, and in the uropods and telson. The stripes and patches of yellow-ochre which he notices on the three hinder pairs of peræopods are not peculiar to any one species of *Urothoe*, being due to the gland-cells which are found in almost every part of the animal. The spines on the third, fourth, and fifth joints of the third peræopods are not fully represented in Spence Bate's figures, but such details often escape notice, or are only perfunctorily represented before their importance has been brought into special prominence, so that it is rash of Grube to infer that had they been present they could not have been neglected. In regard to the plumose setæ on these limbs Grube himself has fallen into some misapprehension. He says that Spence Bate speaks only of one row of simple hairs on the hind rim of the third peræopods, while in Grube's specimen they are as decidedly plumose as Spence Bate figures them on the fifth pair¹; the first joint, too, appears in Spence Bate noticeably narrowed below, whereas he (Grube) found it equally broad above and below. But Spence Bate speaks only of the first joint as having the hind margin "fringed with a row of simple hairs," just as Grube himself figures it. "The rest of the leg is remarkable for long plumose cilia," according to the account in the 'British Sessile-eyed Crustacea.' In the full figure given in that work of *Urothoe marinus*, the first joint of the third peræopods answers to Grube's description of it; but in a full figure the limbs being seen at all sorts of angles often give but a very rough idea of their actual details, and in the separate figure of the limb in question it is at once seen that the first joint is, as is usual throughout the genus, broader below than above. The first uropods are omitted from Grube's figure of his specimen; but in the Latin description he says that the first and second uropods reach almost equally far back, rarely beyond the peduncle of the third pair, having their rami slightly curved. By this account the position of the species is left obscure. The

¹ It is in *Urothoe elegans*, not in *Urothoe marinus*, that Spence Bate figures the plumose setæ on the fifth peræopods.

telson is described in the Latin as "latius lanceolatum, usque ultra dimidium fissum," and in the German as "cleft only to the middle, much longer than broad, running out into two narrow points, each with a spinule and two setæ." In the species of *Urothoe* in general the telson is cleft much beyond the centre.

In 1879 Sars described, under the name *Urothoë abbreviata*, n. sp., a single specimen, 3 millim. in length, taken in the sea north-west of Finmark, lat. 71° 25' N., long. 15° 40'·5 E., from a depth of 620 fathoms. Of this in 1885 he gave a somewhat fuller description and a figure. In the earlier account he distinguishes it from other species by the abbreviate form of the body, the absence of eyes, and the rudimentary accessory flagellum of the upper antennæ; in the later, "by its remarkably short and thickset body, the peculiar form distinguishing the first pair of antennæ, the absence of eyes, and by the short last pair of caudal stylets." In point of fact these characters are not of much service for the recognition of the species. The short and thickset body is not the exception but the rule in this genus. In the young the eyes are also, as a rule, very inconspicuous. "The first pair of antennæ," according to Sars, "are rather elongate, and unlike those in all other known species." Yet according to his description and figure of these organs they agree very well with the prevalent form, the smallness of the flagellum in all probability only indicating that the specimen was a very young one. Its diminutive size and the shortness of the last uropods are in accord with this supposition. In the earlier account Sars states that the flagellum of the lower antennæ has four joints, just as Boeck does for his *Urothoe norvegica*; but in the later account Sars omits all mention of this flagellum, only saying that these antennæ from their position are difficult to examine without dissection. The circumstance that the almost rectangular corners of the third pleon-segment are *not produced upwards* is probably mentioned as a point of distinction from Boeck's species, but, judging by Boeck's figure, the upward production is wrongly attributed to that species itself. On the whole, with our present information, it is difficult to avoid the conclusion that *Urothoe abbreviata* is the young of *Urothoe norvegica*, a deep-water form, of which fuller and more definite details are still to be desired.

In 1888 M. Chevreux described, under the name "*Urothoe Poucheti*, nov. sp.," a male specimen taken at the surface, off Ponta Delgada, at the island of San Miguel, in the Azores. "This species," he says, "while tolerably near to *Urothoe elegans*, Sp. Bate, differs from it by its less obese form, the size and peculiar appearance of the eyes, and above all by the first two pairs of uropods, which are more developed than in other species of the genus." "The eyes prominent, very large, rounded, meeting one another at the apex of the head," would naturally be a very distinctive character to any one judging only by the published figures of species in this genus. It is, however, common to the fully developed males in several species, and agrees closely with Costa's description of the eyes in *Egidia pulchella*. The uropods, of which M. Chevreux has kindly sent

me a drawing, correspond in general shape and proportions with those of *Urothoe brevicornis*, Sp. Bate; but the peduncle of the first pair shows a series of twenty-four spines, and the outer ramus has four spines, the outer ramus of the second pair carrying three spines. *Urothoe brevicornis*, moreover, is not less, but more, bulky than *Urothoe elegans*.

I have been most kindly assisted with specimens for this paper by M. E. Chevreux, D. Robertson, Esq., and the Rev. Canon Norman. Dr. Norman had already taken up the subject himself, but as soon as he heard that my work was further advanced than his own he at once, *more suo*, placed at my disposal both his preliminary notes and his collection of species from numerous localities.

UROTHOE IRROSTRATUS, Dana.

1852. *Urothoe irrostratus*, Dana, United-States Explor. Exped. vol. xiii. pt. 2, p. 922, pl. 62. figs. 6 a-f.
 1862. „ „ Spence Bate, Brit. Mus. Catal. Amph. Crust. p. 117, pl. xx. figs. 3, 3 c.
 1876. „ „ Boeck, De Skand. og Arkt. Amph. p. 225.

This, which has become the type species of this genus, was only partially figured by Dana, under the impression that this and his *Urothoe rostratus* might be male and female of one species. His description of *Urothoe irrostratus* is:—“Near the *rostratus*. Front not rostrate. Flagellum of the superior antennæ six- or seven-jointed, shorter than the base; appendage very short, two- or three-jointed. Tarsi of feet of fourth and fifth pairs nodulose along inner side, this side somewhat arcuate.” Spence Bate interprets the tarsi to mean the carpus; but in the special figures which Dana devotes to the extremities of the fourth and fifth pairs of feet, the carpus is not included, while the finger shows a nodulose convex inner margin in accordance with the description of the so-called tarsi. It is unfortunate that Dana gives neither figure nor description of the sixth and seventh pairs of feet (the fourth and fifth peræopods). In his notes on the genus he says “the six posterior legs [third, fourth, and fifth pairs of peræopods] are broad lamellar, especially the first, third, and fourth joints.” But just as he evidently inferred without examination that the maxillipeds of *Urothoe irrostratus* were similar to those of *Urothoe rostratus*, so he may have inferred without observation that the fourth and fifth peræopods would be alike in the two species. In the European species the expression “broad lamellar” would not be especially appropriate to the third and fourth joints of the last two pairs of peræopods.

Dana figures the lower antennæ with a long, slender flagellum carrying calceoli, so that there can be no doubt that his specimen was a male. The three joints of the peduncle of the upper antennæ are figured as nearly equal in length.

The exact relationship of this species to its kindred in Europe cannot well be determined until fresh specimens have been obtained from the Sooloo Sea. Should there prove to be any very striking diversity in regard to the fourth and fifth peræopods,

amounting to generic difference, it might be necessary to revive Costa's name *Egidia* for the European species; but it is not very probable that any such necessity will arise.

UROTHOE PULCHELLA (Costa). (Plate IV. A.)

1853. *Egidia pulchella*, Costa, Ricerche su' Crostacei Anfipodi del Regno di Napoli, Rend. d. Soc. r. Borbon. Acad. d. Sci. n. ser. 1853.
 1857. „ „ Costa, Ricerche sui Crostacei Anfipodi del Regno di Napoli, Mem. d. R. Accad. d. Sci. di Napoli, vol. i. p. 190, tav. iv. fig. 3, a-g.
 1876. *Urothoë pulchella*, Boeck, De Skand. og Arkt. Amph. p. 225.
 1885. *Egidia pulchella*, Carus, Prodrömus Faunæ Mediterraneæ, pars ii. p. 419.
 1888. *Urothoë pulchella*, Stebbing, 'Challenger' Amphipoda, p. 297.

Rostrum little developed, lower front corners of the head fully rounded; third pleon-segment with the postero-lateral angles not acute.

Eyes reniform, except in the smaller stages, seemingly never very large.

Upper antennæ. First joint thicker but by no means longer than the second, each having two lines of setæ on the surface; third joint shorter than the first, and much more slender, nearly as long as the five- or six-jointed flagellum; secondary flagellum three- to four-jointed, longer than half the principal.

Lower antennæ. In the male specimen examined the fourth joint of the peduncle had twenty-one spines in the outer row, five in the inner, and several small setæ; the fifth joint had a row of five spines near the outer margin, and eight long serrate setæ near the inner; the flagellum consisted of twenty-three joints, and was more than twice as long as the peduncle. There being no brush of hairs on the fourth joint of the peduncle, and there being spines but no calceoli on the fifth joint, this specimen may not represent the fully adult male. In the female from Naples the fourth joint has twenty-one spines in one row, two in the other, about a dozen long setæ along one margin, and seven at one corner; the fifth joint shorter than the fourth, with a row of eleven spines, ten long setæ near the convex border, and six at the opposite distal corner; the flagellum scarcely as long as the fifth joint of the peduncle, the first joint carrying three rather slender spines, and the second six long setæ and three shorter ones; the second joint is about one third the length of the first, its two apical setæ long.

The triturating organs have on the confronting margins each twelve or fourteen stout spines toothed on two edges, the series being continued along the distal border by six-and-twenty slender serrulate spines or setæ.

Mandibles. The cutting-plate forming a strong blunt tooth; the secondary plate small, on the left mandible denticulate, on the right more slender, strap-like, slightly bifid; the molar tubercle powerful; the second joint of the palp carrying nine setæ, three or four of which are very small; the third joint about as long as the second, nearly acute at the apex, carrying eleven spines, four or five at the apex seta-like.

Lower lip. The outer and inner lobes have the margin well furred; the mandibular processes are divergent.

First maxillæ. The slender, slightly curved, inner plate has on the convex outer margin and apex six plumose setæ; the outer plate has eleven spines on the truncate distal margin, some straight, some curved, all, except perhaps the outermost, more or less serrate, or with a subapical tooth; the palp not reaching so far as the outer plate's apex, having at its base a little lobe of the trunk, the first joint rather broader and longer than the second, which on the truncate apex carries three setæ, the inner serrate, the other two plumose.

Second maxillæ. Inner plate rather shorter than the outer, tending to oval in shape, the apical end narrow, bordered with spines, plumose setæ fringing both it and the distal half of the inner margin; the outer plate with parallel sides, only the truncate distal margin occupied with spines.

Maxillipeds. The inner plates with three plumose setæ on the inner margin, two or three teeth and several plumose setæ or spines on the truncate distal margin; the outer plates bordered with seven stout spines and seventeen plumose setæ of various sizes; the second joint of the palp with the broad distal margin naked, the inner margin and adjacent surface thickly fringed with setæ; the third joint pear-shaped, with a very narrow neck, the broad distal half of the joint set about with groups of setæ, and having the short and narrow slightly furred terminal joint attached to the middle of its distal margin; at the narrowed apex of the fourth joint there are two setæ and three or four very small ones near the apex.

First gnathopods. Side-plates not very narrow, the lower hinder angle forming a well-produced rounded point, with a single spinule. Limb as in *Urothoe marinus*, but with only seven spines in the spine-row adjoining the broad distal margin of the wrist, and the hand oval.

Second gnathopods. The narrow hand is slightly distinguished from that of other species by the prominence of the small convex palm, and is about four fifths as long as the wrist.

First and second peræopods nearly as in *Urothoe marinus*, but the fourth joint has six or seven spines, the fifth has nine or ten, and the finger has six or seven small tubercles, which in the second pair are set very closely together. In the first pair the side-plates have eight or nine spinules at the lower hind corner. The marsupial plates of the female, here and apparently in the kindred species, long and slender, and when fully developed having the distal half fringed with moderately long setæ.

Third peræopods. The hind rim of the side-plates almost completely smooth. The limb distinguished from that of *Urothoe brevicornis* by having the fourth joint very much broader than the third, this joint (although belonging to a smaller species) having more numerous spines in the spine-rows, and also on its distal margin a great number of very long densely plumose setæ; the fifth joint is broad, and the finger not gently

tapering as in *Urothoe brevicornis*, but narrowing rather abruptly as in *Urothoe marinus*, from which, however, it differs in having on the front margin many little sharp denticles rather closely set, even that nearest the tip being of no great size, nor does the tapering part form a concave margin as in the last-named species.

Fourth peræopods nearly as in *Urothoe brevicornis*, the third joint not shorter than the fourth, the fourth with four or five groups of spines on the front and two on the hind margin; the finger more than half the length of the fifth joint, very narrowly tapering, with numerous little teeth or tubercles along the front margin.

Fifth peræopods nearly as in *Urothoe marinus*, but the side-plates less crenate, the first joint scarcely at all more widened above than below, the fourth joint with four or five groups of spines on the front and two on the hind margin, the slender tapering finger more than half the length of the fifth joint, with from twenty to thirty little tubercles along its front margin; the first joint in the female having the front margin slightly more convex than in the male.

Pleopods nearly as in *Urothoe marinus*, but none of the peduncles elongate, and the joints of the inner ramus not exceeding thirteen, those of the outer not exceeding nineteen in number.

Uropods nearly as in *Urothoe marinus*, but outer branch of first pair with only two spines, branches of second pair without armature, the branches of the third pair with fewer setæ, and the inner branch only reaching the base of the second joint of the outer.

Telson short, with very convex sides, otherwise nearly as in *Urothoe brevicornis*.

Length about a fifth of an inch.

Localities. Naples (specimens obtained by Canon Norman) and off the west coast of France (specimens obtained by M. E. Chevreux).

UROTHOE ELEGANS, Sp. Bate. (Plate I.)

1856. *Gammarus elegans*, Sp. Bate, On the British Edriophthalma, Brit. Assoc. Report for 1855.
 1857. *Urothoë elegans*, Sp. Bate, Synopsis of Brit. Edr. Crust., Ann. & Mag. Nat. Hist. ser. 2, vol. xix. p. 145.
 1857. „ „ White, Popular History of British Crustacea, p. 186.
 1862. „ „ Sp. Bate, Brit. Mus. Catal. Amph. Crust. p. 117, pl. xx. fig. 2.
 1862. „ „ Bate & Westwood, British Sess. Crust. vol. i. p. 200, woodcut.
 1869. „ „ Norman, Last Report on Dredging among the Shetland Isles, Brit. Assoc. Report for 1868, p. 279.
 1876. „ „ Giard, Comptes Rendus, Jan. 3, p. 76; Ann. & Mag. Nat. Hist. ser. 4, vol. xvii. p. 261.
 1876. „ „ Stebbing, Ann. & Mag. Nat. Hist. ser. 4, vol. xvii. p. 344.
 1879. „ „ Sp. Bate, The Crustacea in Couch's Cornish Fauna revised and added to Journ. Roy. Inst. Cornwall, no. xix. pt. ii. p. 48 (sep. copy).

1884. *Urothoe elegans*, Chevreux, Assoc. pour l'av. des Sciences, Congrès de Blois, Amph. du Croisic, p. 2 (sep. copy).
 1887. „ „ Chevreux, Crust. Amph. Bretagne, Bull. Soc. Zool. de France, t. xii. extr. p. 11.
 1888. „ „ Chevreux, Amph. du litt. des Açores, p. 5.

Rostral point obtuse, very slightly produced. Postero-lateral angles of the first pleon-segment having a minutely produced point, those of the second more sharply produced, those of the third slightly rounded.

Eyes moderately large in the adult male.

Upper antennæ. Peduncle as in *Urothoe marinus*; flagellum six-jointed; secondary flagellum slender, three-jointed, decidedly less than half as long as the principal.

Lower antennæ. In the adult male peduncle very nearly as in *Urothoe marinus*, the fourth joint, however, having sixteen or eighteen spines in one row, and two or three in the other, the fifth joint carrying a row of nine calceoli on one edge, and four or five rather small setæ on the other; the flagellum between two and three times as long as the peduncle, consisting of forty joints. In one specimen on one antenna each of the first five joints, on the other each of the first three had a calceolus, the remaining joints being alternately without and with these appendages. In the female the fourth joint longer than the fifth, carrying fourteen spines in one row and two in the other, with a few setæ, the fifth joint having six spines and four of the long setæ; the flagellum full as long as the fifth joint of the peduncle, with one spine and four setæ on the first joint, the slender second joint being half as long as the first, the two setæ at its tip not very elongate.

Mandibles. Cutting-plate like a broad tooth; the little secondary plate on the left mandible (when unworn) cut into five little unequal teeth, on the right strap-shaped; the third joint of the palp longer than the second, with five setæ in a series beginning low down on the front margin, and two accompanied by two spines at the apex.

Lower lip. Mandibular processes well developed.

First maxillæ. Inner plate slender, curved, with two plumose setæ on the rounded apex; outer plate as in *Urothoe pulchella*; second joint of the palp about equal in length and thickness to the first, fully reaching the apex of the outer plate, having three setæ on its distal margin.

Second maxillæ as in *Urothoe pulchella*, but with the plumose setæ not fringing all the distal half of the inner margin of the inner plate.

Maxillipeds differing but little from those of *Urothoe pulchella*; the outer plate with five spines; the second and third joints of the palp not so much distally widened.

First gnathopods. Side-plates distally widened, with two spinules at the lower hind corner. The wrist with seven or eight spines in the row on the very sloping distal margin; the hand narrowly oval.

Second gnathopods as well as the *first*, in general character, like those of *Urothoe marinus*, but with narrower wrists and hands.

First and second peræopods as in *Urothoe marinus*, but comparatively slender, with only four stout spines on the fourth joint, eight on the fifth, the finger with three or four small and distant pointed tubercles. The side-plates of the first pair have five spinules at the indented hind corner.

Third peræopods. The side-plates with the hind margin only slightly indented. The limb strikingly distinguished from that of *Urothoe pulchella* by having the fourth joint not broader than the third, with about seven spines in each of its spine-rows; the finger is comparatively narrow, the distal half slenderly tapering, with about seven small tubercles on the front margin.

Fourth peræopods differing little from those of *Urothoe marinus* and other species, but having the third joint shorter than the fourth, with five or six plumose setæ on the hind margin, the fourth joint shorter or not longer than the fifth, with three groups of spines in front and two behind, the finger very slender and tapering, with about seven denticles on the front margin.

Fifth peræopods in general character like those of *Urothoe marinus*, but the first joint not widened above, and with no conspicuous row of spinules on the upper part of the hind margin; the third joint with two groups of spinules on each margin, the fourth and fifth joints each with three groups on the front and two on the hind margin; the finger very slender, more than half as long as the fifth joint, with some seven or eight little nodules on the front margin. The female has the front margin of the first joint convex instead of nearly straight.

Pleopods as in *Urothoe marinus*, but with fewer joints to the rami, the inner having eleven or twelve, the outer thirteen or fourteen.

Uropods similar to those of *Urothoe brevicornis*, but the rami of the two first pairs smooth, the peduncle of the second pair having only one spine on the inner margin; the inner ramus of the third pair is sometimes very decidedly shorter than the outer; the number of plumose setæ on the rami of the third pair appears to be too variable to afford a character.

Telson not very broad, nearly as in *Urothoe brevicornis*.

Length less than a fifth of an inch.

Localities. The specimens figured were dredged in February 1889 from a depth of 20 fathoms, off Fairlie Perch, in the Clyde, near Cumbrae, by Mr. David Robertson. Other specimens examined were taken by Canon Norman in dredging among the Shetland Isles. The original specimen, to which the name was given by Mr. Spence Bate, came from the neighbourhood of the Eddystone Lighthouse.

UROTHOE MARINUS, Sp. Bate. (Plate II.)

1857. *Sulcator marinus*, Sp. Bate, Synopsis of Brit. Edr. Crust., Ann. & Mag. Nat. Hist. ser. 2, vol. xix. p. 140.
1857. " " White, Popular History of British Crustacea, p. 175.
1862. *Urothoë marinus*, Sp. Bate, Brit. Mus. Catal. Amph. Crust. p. 115, pl. xix. fig. 2.
1862. " " Bate & Westwood, British Sess. Crust. vol. i. p. 195, woodcuts.
1869. " " ? var. *pectinatus*, Grube, Mitth. über St. Vaast-la-Hougue, Abh. der schles. Gesellsch. für vaterl. Cultur, 1868-9, p. 119.
1869. " " Norman, Last Report on Dredging among the Shetland Isles, p. 279.
1876. " *marina*, Giard, Comptes Rendus, Jau. 3, p. 76; Ann. & Mag. Nat. Hist. ser. 4, vol. xvii. p. 261.
1876. " *marinus*, Stebbing, Ann. & Mag. Nat. Hist. ser. 4, vol. xvii. p. 344.
1877. " *marina*, Meinert, Crust. Isop. Amph. et Decap. Daniæ, p. 107.
1884. " *marinus*, Chevreux, Assoc. pour l'av. des Sciences, Congrès de Blois, Amph. du Croisie, p. 313.
1887. " " Barrois, Morph. des Orehesties et liste Amph. du Boulonnais, p. 16.
1887. " *marina*, Bonnier, Catal. Crust. Malae. Concarneau, p. 79.
1887. " " Chevreux, Crust. Amph. Bretagne, Bull. Soc. Zool. de France, t. xii. extr. pp. 10, 34, 36.
1888. " " Chevreux, Dragage de l'*Hirondelle* au large de Lorient, p. 1.
1888. " " Chevreux, Amph. réc. anx env. de Cherchell, extr. p. 5.
1888. " *marinus*, Robertson, Catal. Amph. and Isop. of Clyde, p. 30.

The sides of the rostrum not forming an obtuse angle, but the apex not acute. The postero-lateral angles of the second pleon-segment acutely produced, but not those of the first or the third segment.

Eyes very large in the adult male, nearly meeting on the top of the head.

Upper antennæ. First joint thicker, but scarcely longer, than the second, each with an elongate group of setæ on the upper or outer side, and (in the adult male) a brush-like fringe of hairs on the lower or inner; the third joint thinner than the second, two thirds as long, with a few hairs; flagellum nine-jointed; secondary flagellum, little more than half as long as the principal, five-jointed.

Lower antennæ. In the adult male first three joints short, gland-cone very inconspicuous, the third joint having a tuft of hairs near the inner distal angle; the fourth joint longer than the three preceding united, closely fringed on one side with a brush of hairs, which also pass round the distal margin, on the other side carrying numerous unequal spines, eighteen in one row, four in the other, and also some setæ; the fifth joint nearly as long as the fourth, carrying twelve setæ on one edge, and eight calceoli, each with an accompanying tuft of hairs, on the other; the flagellum very long and slender, with fifty joints, each of the first six having a calceolus, and of the next forty-two each alternate one, the calceoli being smaller towards the end of the flagellum. In a specimen with no fringe of hairs and no calceoli the fifth joint of the peduncle has a

row of ten unequal spines, and the flagellum consists of twenty-five joints. In a female specimen from the same locality the fourth joint has seventeen spines in one row and three in the other; the fifth joint is decidedly shorter than the fourth, and has nine or ten spines, the long setæ of this and the preceding joint being fewer than in the female specimen described of *Urothoe brevicornis*. The flagellum is as long as the last joint of the peduncle, the first joint carrying two spines near the distal end, and eight long setæ round it; the little terminal joint is scarcely more than a third of the breadth of the preceding.

Mandibles as in *Urothoe elegans*, but the long setæ on the second joint of the palp more numerous, and the long narrow third joint having ten spines along the front margin, and two at the apex, together with four others that are long and more or less setiform.

Lower lip. Mandibular processes strongly developed.

First maxillæ. The curved inner plate with four or five setæ on and near the apex; outer plate and palp as in *Urothoe elegans*.

Second maxillæ with plumose setæ passing round the apex and the distal half of the inner margin of the inner plate, which also has a row of plumose spines on the apical margin, these maxillæ not sensibly differing from those of *Urothoe pulchella*.

Maxillipeds nearly as in *Urothoe pulchella*, the inner plates rather broader, the outer with six stout spines and twenty setæ, thus arranged—a short seta, three rather large ones, a group of three small ones, of which the middle is the longest, such a group followed by a stout spine occurring four times in succession, then a single seta, two stout spines, and (on the apical margin) three plumose setæ. The number of spines and setæ, however, cannot be depended on as constant in this species, or probably in any of the others. Here the third joint of the palp is more elongate than in *Urothoe pulchella*.

First gnathopods. Side-plates narrow, with a group of three spinules at the lower hind corner. The first joint slender, with a few spinules on the front margin, many long pectinate setæ on the hind margin, and four groups of them on the inner surface; the second joint short, with one group of setæ on the hind margin; the third joint with one or two setæ on the hind margin, its apex acute; the wrist almost as long as the first joint and much broader, the convex hind margin or breast closely fringed with unequal setiform spines, the inner surface carrying five or six groups, the row of pectinate spines at the distal margin twelve in number; overlapping this row and running to the front margin is a row of microscopic spinules, such a series being found in all the species examined; the hand about three quarters as long as the wrist, much narrower, with setiform spines in two rows on the inner surface, in one row on the outer, and fringing more than the distal half of the hind margin; the palm oblique, microscopically pectinate, fringed with various setules, and defined by a stout spine,

beyond which the capped tip of the finger reaches; the finger carries two or three setules.

Second gnathopods. Side-plates distally widened, the lower distal angle not having, as in the first pair, a produced point, carrying a group of seven setules. The sack-like branchial vesicle as long as or longer than the first joint. The limb differs from that of the first pair in having the first joint more elongate, with two instead of four groups of setæ on the inner surface; the long setæ on the second and third joints are more numerous; the wrist is narrower and without the special armature of the distal margin; the hand has less of the hind margin furnished with setæ, and the palm a little less oblique; the finger is decidedly shorter, its tip reaching very little beyond the palmar spine.

First peræopods. Side-plates widened below, with six or seven spinules on the upward curved hinder part of the lower margin. Branchial vesicle longer than the first joint, nearly uniform in breadth, except at the point of attachment. First joint straight, with setæ at the apex of the hind margin, and near that of the front; second joint with a group of setæ about the apex of the hind margin; third joint as long as the fourth and fifth joints together, having groups of setæ along the hind margin, and near it a transverse group high up on the outer surface, which also carries an oblique series near the apex of the convex front margin; the fourth joint nearly as broad as the third, with an oblique group of setæ approaching the distal end of the front margin, several bent plumose setæ and four graduated stout spines along the undulating hind margin, one stout spine and four setæ on the distal border, which projects strongly behind the fifth joint; the fifth joint a little shorter than the preceding, and scarcely half its width, carrying seven or eight unequal short spines directed towards the finger, the distal part of the hind margin undulating; the finger straight, except at the tip, with five tubercles along the hind margin, which, with the spines of the fourth and fifth joints, must give it a prehensile character; the slightly bent tip has a transparent cap.

Second peræopods. Side-plates broader than in the preceding pair, with the spinules not grouped at the corner, but spread along the lower margin. Branchial vesicle much dilated below the long neck. Limb scarcely differing from that of first pair, except that the first and third joints are longer, and the first is a little sinuous.

Third peræopods. Side-plates with the hind lobe deeper than the front, its margin crenulate with spinules in the indents. Branchial vesicles narrowed at the two extremities. The first joint very broad, distally widened, the wing often darkened by the crowd of gland-cells, the upper corners rounded, the lower hinder angle not very acute, sometimes rounded, the front margin rather sinuous, with two or three spinules above, two groups of setæ below, and a few spines at the apex, the hind margin crenulate, and having about a dozen setæ, the straight lower margin of the wing carrying two or three setules; the second joint not half the width of the first, but broader than long, with a group of setæ and a spine at the apex of the front; the third

joint rather longer, scarcely broader, with a group of setæ and a spine at the indent of the front margin, the apex of which has five spines: a row of seven spines arms the lower margin of the outer surface and the rounded hinder apex, the corresponding margin of the inner surface being fringed with some sixteen immensely long and densely plumose setæ, some of which reach to the extremity of the limb; there are sometimes short plumose setæ along the hind margin; the fourth joint is nearly as long as the two preceding joints together, and decidedly, yet not very greatly, wider than either; on the outer surface there is a series of eight unequal spines reaching the indent of the front margin, and another reaching that of the hind margin; below these there are two distal series, respectively of six and eight spines, and on the hinder part of the distal margin there are also on the inner surface some long plumose setæ; the fifth joint is longer, but very much narrower than the fourth, having at the middle of the hind margin a group of five unequal spines, and of three at the apex, on the strongly indented front margin three groups of seven, six, and five respectively, and on the inner surface below the middle a row of five long densely plumose setæ; the finger is not much shorter than the fifth joint, comparatively broad, except near the cap-bearing tip, containing, like almost all other parts of the animal, numerous gland-cells with their ducts and minute circular openings; the hind margin almost straight, carrying near the base a small plumose cilium, the front margin at first smooth, but for two thirds of its length armed with nodules, about thirteen in number, the first eight or nine successively larger, the next one, two, or three small and sharper than the rest, followed by one near the tip longer than any of the others.

Fourth peræopods. Side-plates narrower than in the preceding pair, the hind margin crenate and fringed with spinules. The branchial vesicle smaller than in the preceding pair. The first joint large and oval, rather broader below than above, the front margin a little sinuous, with two or three spinules above, and three or four groups of pectinate setiform spines below; the convex hind margin very shallowly crenulate, with spinules in the indents; the wing has numerous gland-cells, and sometimes as many as sixteen long and very plumose setæ, planted in a slight curve a great way from the margin on the inner surface; the short second joint has a group of pectinate spines at the apex of the front margin; the third joint, which is more than twice as long as broad, has three groups of spines along the front, nine long, much flattened, setæ along the hind margin, and a spine at its apex; the fourth joint is longer than the third, and has four groups of rather stout spines along the front, and three mixed groups along the hind margin; the fifth joint is narrower than the fourth, scarcely longer than the third, with three groups of stout spines along the front, one at the sharply produced apex of the hind margin, and a little higher up a slender group; the finger is half the length of the fifth joint, straight, very slender, with a plumose cilium on the hind margin near the base, several little nodules along the front, of these that near the curved tip of the finger being as usual the largest.

Fifth peræopods. Side-plates small, with the hind margin crenulate. The branchial vesicle directed forward, not much longer than broad, very much shorter and narrower than the first joint of the limb. The first joint broader than in the preceding pair and as long, the widest part not far from the base, the broad wing containing numerous gland-cells, its irregularly convex border shallowly indented and fringed with spinules, of which, as in the preceding pair, those at the upper part are much larger than those below; the front margin nearly straight or a little convex, with three or four groups of spines; the short second joint having a group of spines at the apex of the front; the third joint decidedly shorter than the fourth, with three groups of spines in front and two or three behind; the fourth joint with four or five groups of spines on the front, and three or four on the hind margin; the fifth joint subequal in length to the fourth, but narrower, with three or four groups of spines in front and two behind; the finger straight, slender, tapering, about half the length of the fifth joint, with seven or eight little nodules along the front margin, and the usual plumose cilium near the base. The whole limb is a little shorter than that of the fourth pair, the difference being chiefly owing to the shorter third joint.

Pleopods. The peduncles of the first pair the longest, in all the pairs carrying one or two groups of setæ on the lower margin. The coupling-spines (*retinacula*¹) long and slender, with five or six teeth, besides the strongly bent apex; in general there are two only of these organs on the peduncle, but in one instance four were counted; there is always a plumose spine with them; the cleft spines on the first joint of the inner ramus two or three in number; the spoon-shaped arm much shorter than the serrate one; the inner ramus sometimes with sixteen, the longer outer one with twenty joints.

Uropods. The stout peduncle of the first pair subequal in length to the outer ramus, having on the outer margin one or two groups of setiform spines and a row of about seven small spines, and a row of three on the inner margin; the rami are not very long, smooth, the inner much smaller than the outer, both strongly curved, although in some positions the curvature may not be very distinctly seen; peduncles of the second pair rather shorter and narrower than those of the first, similarly armed, but with rather stronger spines; the rami subequal, the outer almost imperceptibly the longer, both smooth, slightly curved, a little longer than the peduncle; peduncles of the third pair stouter than the preceding pairs, not longer than broad, having groups of spines about the distal margin; the rami long and moderately broad, extending for nearly their whole length beyond the telson and the other uropods, subequal, fringed with numerous long plumose setæ; in one specimen the outer ramus had on its outer margin twenty, two at the apex of the little second joint, and eight on the inner margin; the inner ramus had

¹ In regard to the occurrence of the *retinacula* in various groups of Crustacea, and their phylogenetic importance, see the interesting footnote in 'Carcinologische Mittheilungen,' ix. p. 220, by Paul Mayer, 1880. By Carl Bovallius they had been recognized in his account of "*Pterygocera arenaria*." Dr. Boas calls them in German "Heftbaken." When I wrote my 'Challenger' report these notices had escaped my attention.

nine on the outer margin, two at the apex, and fourteen on the inner margin. In another specimen, also a male, and from the same locality, there were only fifteen setæ on the outer and seven on the inner margin of the outer ramus, while in this specimen the second joint was more elongate than in the other. Very little constancy is to be expected in the number of these ornaments, which undoubtedly varies with the age of the animal, as well as probably between individuals of the same age.

Telson. Cleft nearly to the base on the upper side and quite to the base on the under side, the cleft gaping a little distally, the convex outer margins having each two cilia near the centre, and a spinule not far from the apex, the distal margin of each half oblique, carrying a feathered cilium, a short stout spine, and three setæ.

Length of a good-sized specimen one third of an inch.

Localities. The specimen figured was taken at a low tide in February 1889, at Cumbrae, in the Clyde, by Mr. David Robertson. Other specimens examined and considered to belong to this species were obtained by M. E. Chevreux, of le Croisic, Loire-Inférieure, off the French coast, and in Balta Sound, Shetland, by Canon Norman. M. Chevreux in recording *Urothoe marinus* from "les environs de Cherchell," says, "le genre *Urothoe* n'était pas représenté jusqu'ici en Méditerranée," but this is overlooking *Urothoe pulchella* (Costa).

UROTHOE NORVEGICA, Boeck. (Plate IV. B.)

1860. *Urothoë norvegica*, Boeck, Forhandl. ved de Skand. Naturf. 8de Möde, p. 647.
 1870. " " Boeck, Crust. Amph. bor. et arct. p. 58.
 1876. " " Boeck, De Skand. og Arkt. Amph. p. 226, pl. vi. fig. 9, pl. vii. fig. 4.
 1882. " " Sars, Oversigt af Norges Crustaceer, p. 22.
 1887. " " Chevreux, Crust. Amph. dragués par l'*Hirondelle*, Bull. Soc. Zool. de France, extr. pp. 13, 15.
 1887. " " Chevreux, Crust. Amph. Bretagne, Bull. Soc. Zool. de France, t. vii. extr. p. 10.
 1888. " " Robertson, Catal. Amph. and Isop. of Clyde, p. 29.

Postero-lateral angles of the first three pleon-segments acute, those of the first two only minutely produced.

Upper antennæ. The first joint of the peduncle stout, the third joint decidedly shorter than the first or second; the flagellum of five joints, together little longer than the first or second joint of the peduncle; the secondary flagellum three-jointed, about half the length of the principal.

Lower antennæ. Fourth joint of the peduncle longer and much stouter than the fifth, carrying a single row of about sixteen unequal stout spines near the convex margin, and a row of setæ apparently unmixed with stout spines; the fifth joint carrying five stout spines and some setæ; the flagellum consisting of eighteen naked joints, the structure being indicative of a male not fully adult.

Mouth-organs as in *Urothoe elegans*. The palp of the *first maxillæ* consists of two equal joints, and has three setæ on the apex.

First gnathopods. The side-plates with a row of six setæ on the truncate distal margin. The limb nearly as in *Urothoe elegans*, the spine-row at the apex of the wrist consisting of only three or four spines.

Second gnathopods nearly as in *Urothoe elegans*.

First and second peræopods scarcely to be distinguished from those of *Urothoe elegans*, except that the inner margin of the finger, which in that species has very few nodules, is here closely serrate, of the series of projecting points only the large one nearest the tip of the finger being blunt enough to deserve the name of a nodule.

Third peræopods distinguished from those of *Urothoe elegans* by the much rounded lower hind corner of the first joint, fewer plumose setæ on the third and fourth joints, and by the close serration of the distal half of the slender tapering finger.

Fourth peræopods. The front margin of the first joint has some spinules at four points of the upper part, and at intervals on the lower part four long plumose setæ; the third joint is longer than the fourth, the plumose setæ on the hind margin missing, but not originally more than three or, at most, four in number; the finger slender, closely serrate for two-thirds of its length.

Fifth peræopods nearly as in the female of *Urothoe elegans*, but here the third and fifth joints are nearly equal in length, the fourth joint being decidedly longer than either, with spines at four points of the front and at three of the hind margin.

Pleopods. The peduncles short; the cleft spines two or three; the inner ramus with ten or eleven joints, the outer with thirteen to fifteen.

Uropods. Peduncles of the first pair a little longer than the straight slender rami, the outer ramus with one spinule just above the middle, the inner equal in length, smooth; the peduncle of the second pair not longer than the rami, which are slender, straight, subequal to one another, but shorter than those of the first pair; they are smooth, or possibly there is a spinule on the outer ramus; the peduncles of the third pair are shorter than the rami; the inner ramus is considerably shorter than the outer, with a single seta near the extremity of its outer margin, five or six plumose setæ on the inner margin; the outer ramus has a spinule and seta at three points on the lower half of each margin; the second joint is a third the length of the first.

Telson cleft nearly to the base so as to form two halves almost oval, but straight at the base, and with the adjoining margins slightly compressed along the upper part; below the centre of each outer margin there are two cilia, and from an incision in each rounded and rather narrow apex projects a moderately long spine, with a minute cilium adjoining on the outer side.

Length about one fifth of an inch or less.

Locality. The Shetland Isles, taken by the Rev. A. M. Norman in 1867.

UROTHOE BREVICORNIS, Sp. Bate. (Plate III.; Plate IV. C.)

1862. *Urothoë brevicornis*, Sp. Bate, Brit. Mus. Catal. Amph. Crust. p. 116, pl. xx. fig. 1.

1862. „ „ Bate & Westwood, British Sess. Crust. vol. i. p. 198, woodcuts.

1879. „ *marinus*, Stebbing, Sess. Crust. Devon., Trans. Devon. Assoc. vol. xi. p. 519.

Rostrum forming an obtuse angle, but with a little acute point between the upper antennæ. Second pleon-segment with the plumose setæ large and numerous, the produced point of the postero-lateral angles minute.

Eyes very conspicuous in the male, approaching one another very closely.

Upper antennæ nearly as in *Urothoe marinus*. In the adult male specimen the first joint of the peduncle was decidedly longer than the second, and the principal flagellum had seven joints, the accessory flagellum being more than half its length, with six joints, of which the last was minute.

Lower antennæ. In the adult male peduncle nearly as in *Urothoe marinus*, but in the fourth joint the brush of hairs not passing round the distal margin; the spines twenty-two in one row, five in the other, the setæ more numerous; the fifth joint rather longer than the fourth, with nine calceoli on one side, and eight long plumose setæ on the other; the flagellum not once and a half as long as the peduncle, having twenty-three or twenty-four joints, with a calceolus to each of the first three or four, and then on alternate joints for some distance along. In the female the fourth joint is longer than the fifth, and has twenty-five spines in one row, seven in the other, with numerous long serrate setæ near the straight inner border, and a group of about a dozen near the produced distal corner of the convex side; the fifth joint has thirteen spines along the convex border, with a group of eight long setæ near its distal end, and along the other border some fifteen long setæ; the two-jointed flagellum is shorter than the last joint of the peduncle; the first joint has ten long setæ round the distal half, and three spines on one margin; the little second joint is about a quarter the length and not half the breadth of the first, and is tipped with two slender setæ several times its own length. Both in male and female the fourth and fifth joints of the peduncle have some little stiff setæ or cilia, which are strongly plumose, and appear as if twisted at the centre.

Upper lip with a smoothly rounded margin to the principal plate, except that in the centre a little space is marked off by a small notch on either side, the tract so marked off being distally smooth, but furry on the sides. The inner plate appears to have a quite smooth margin not reaching quite to the distal margin of the outer plate. The structure of this lip seems to be tolerably uniform in all the species.

Mandibles as in *Urothoe marinus*, except that the third joint of the palp has nearly two thirds of the inner margin clear of spines.

Lower lip as in *Urothoe marinus*.

First maxillæ. The inner plate with three plumose setæ on the apex; outer plate as in the other species; palp with the first joint rather longer than the second, the second with the usual three setæ on the apex.

Second maxillæ. The plumose setæ occupying two thirds of the inner margin of the inner plate.

Maxillipeds, probably not to be distinguished from those of *Urothoe marinus* by any constant character; thus in one specimen one of the outer plates had six, and the other seven, stout spines, while in another specimen each of these plates had eight stout spines.

First and second gnathopods not distinguishable from those of *Urothoe marinus*. In a male specimen from North Wales there were eight spines in the distal spine-row of the wrist, in a female from the same locality ten, and in another female from South Devon fourteen.

First and second peræopods scarcely, if at all, distinguishable from those of *Urothoe marinus*. In the specimens examined the fourth joint had six spines instead of five, and the fifth joint eight spines instead of seven, while the tubercles on the finger were fewer and less pronounced.

Third peræopods closely resembling those of *Urothoe marinus*, but the large first joint with fewer indents on the hind margin, and its apex rather more acute; the third joint has nine or ten spines in each group of its distal margin; the fourth joint ten or eleven in each of its four groups; the fifth joint also has larger groups of spines, and is rather more widened, whereas the distal narrowing of the finger is much less abrupt than in the species compared, and the marginal nodules are smaller.

Fourth peræopods nearly resembling those of *Urothoe marinus*, but the third joint is here rather longer than the fourth, having almost the whole of the hind margin fringed with the long plumose setæ.

Fifth peræopods closely resembling those of *Urothoe marinus*, but with the first joint of the limb not wider above than below. In the female the first joint appears to have the front margin more convex than in the male.

Pleopods as in *Urothoe marinus*, but with no more than two cleft spines observed on the ramus of any specimen.

Uropods. Peduncle of the first pair much more elongate than in *Urothoe marinus*, with two groups of setiform spines and five stouter spines on the outer and four spines on the inner margin; the rami slender, subequal in length to one another and to the peduncle, nearly straight, reaching beyond the second pair, the outer having three spines upon it, the inner having a little seta on its inner margin; the peduncle of the second pair much shorter than that of the preceding pair, shorter than the rami, with four spines on the outer and two on the inner margin; the rami subequal, shorter than the preceding pair, straight, the outer with two spines, the inner with a little seta; the peduncle of the third pair rather longer than broad, but otherwise this pair is scarcely, if at all, to be distinguished from the corresponding pair in *Urothoe marinus*.

Telson differing very little from that of *Urothoe marinus*, the convex margins unbroken

by the insertion of a spinule, the distal margin less broad, carrying a feathered cilium, a spine, and one or two setules.

Length. A quarter to a third of an inch.

Localities. The specimen figured was taken with others of both sexes at Llanfairfechan in North Wales, from the banks of little streams or pools left in the sands at low tide. The species has also been obtained at Goodrington, near Torquay, from the sand left bare at low tide. The specimen to which Spence Bate gave the name *brevicornis* was taken at Tenby, a locality intermediate between the two just named, and presents such differences from the description of the adult here given as might be expected in an example only a tenth of an inch long. Recently the species has been met with in North Devon.

[UROTHOE POUCHETI, Chevreux.

1888. *Urothoe Poucheti*, Chevreux, Crust. Amph. du littoral des Açores, Bull. Soc. Zool. de France, t. xiii. janvier 1888, p. 34.

When this paper was sent to the Zoological Society, the type specimen of *Urothoe poucheti*, which is at present unique, was being exhibited in the Pavillon de Monaco at the Paris Exhibition. It has since been lent me through the kind instrumentality of M. Chevreux, naturally, however, without being available for dissection, which is almost essential for a full and accurate account of a species in this genus. Under this restriction the following brief notes were made upon it:—

Eyes strikingly large and black, the specimen being a male.

First gnathopods. The finger longer than in the second pair.

Third peræopods. The lower hinder angle of the first joint well rounded. The third joint not broader than the second, and not strongly spined, but with long plumose setæ; the fourth joint not broader than the third; the finger long and slender, the distal half serrate.

Fourth peræopods. The first joint having slender spines on the lower part of the front margin, and seven plumose setæ within the wing; the third joint longer than the fourth, instead of shorter as in *Urothoe elegans*.

Fifth peræopods. Front margin of the first joint straight.

Uropods. The first pair with the rami equal, slender, not quite so long as the peduncle; the second pair considerably smaller than the first, the rami equal, slender, shorter than the peduncle; the third pair with long rami reaching back beyond those of the first pair.

The postero-lateral corners of the third pleon-segment are slightly rounded, almost rectangular.

The species approaches *Urothoe elegans*, Spence Bate, and in regard to the third peræopods it much resembles *Urothoe norvegica*, Boeck; but taking all the characters

together (see page 9), it must be regarded as distinct from all the earlier known members of the genus.—T. R. R. S., Sept. 1890.]

UROTHOIDES, nov. gen.

1888. *Urothoe*, Stebbing, 'Challenger' Amphipoda, Zool. Reports, vol. xxix. p. 824.

Nearly resembling *Urothoe*, Dana, in regard to the antennæ, mouth-organs, gnathopods, first and second peræopods, and the pleon.

Third and fourth peræopods having the first, third, and fourth joints much expanded, the third joint more widely than the fourth; these limbs not armed with long plumose setæ as in *Urothoe*.

Fifth peræopods having the much expanded first joint strongly produced downwards behind, and with a strongly serrate hind margin.

The fingers of the *peræopods* not nodulous on the inner margin.

The name is derived from *Urothoe*, a closely related genus, and εἶδος, likeness.

UROTHOIDES LACHNEËSSA.

1888. *Urothoë lachneëssa*, Stebbing, 'Challenger' Amphipoda, Zool. Reports, vol. xxix. p. 825, pl. lvii.

It is with some hesitation that I now propose a new genus for this recently published species. When originally including it in the genus *Urothoe* I was not aware how singularly compact a group the existing species of that genus formed, and how intimately connected with one another they were in many minute details.

Since the 'Challenger' Report was published I have examined an additional specimen of this species, in which the upper antennæ proved to be abnormal. The entire peduncle is stout, the second joint not longer than broad, the third longer than either the first or second, conically produced along two thirds of the first joint of the secondary flagellum. The principal flagellum consists of four joints, the secondary flagellum of three, the first of which is as long as the other two together, and the three together are as long as the principal flagellum. It may be assumed that the malformation results from a coalescence of the third joint of the peduncle with the first one or two joints of the principal flagellum, or it might be more correct to say that the articulations have not been developed so as to produce the usual distinction of these joints.

The second segment of the pleon is not armed with long plumose setæ as in the genus *Urothoe*, and the rami of the third uropods are also devoid of these ornaments. In the species of *Urothoe* the outer of these rami is perhaps invariably longer than the inner, but sometimes the difference is scarcely perceptible, whereas in the present species the difference between the two rami is very great.

SUMMARY AND INDEX.

The history of the genus may be shown in brief by the following list:—

	Pages
1852. <i>Urothoe rostratus</i> , Dana : since called <i>Phoxocephalus rostratus</i>	3, 4
1852. <i>Urothoe irrostratus</i> , Dana	4, 10
1853. <i>Egidia pulchella</i> , Costa : since called <i>Urothoe pulchella</i>	4, 11
1856. <i>Gammarus elegans</i> , Bate : „ „ <i>Urothoe elegans</i>	4, 5, 9, 13
1857. <i>Sulcator marinus</i> , Bate : „ „ <i>Urothoe marinus</i>	5, 16
1860. <i>Urothoe norvegica</i> , Boeck	6, 7, 9, 21
1862. <i>Urothoe bairdii</i> , Bate : since called <i>Urothoe marinus</i>	7
1862. <i>Urothoe brevicornis</i> , Bate	7, 10, 23
1869. <i>Urothoe marinus</i> , Bate, ? var. <i>pectinatus</i> , Grube	8
1874. <i>Urothoe</i> , species, S. I. Smith : since called <i>Harpinia</i> , species	4
1879. <i>Urothoe abbreviata</i> , G. O. Sars	3, 9
1880. <i>Urothoe pinguis</i> , Haswell : since called <i>Harpinia</i> (?) <i>pinguis</i>	4
1888. <i>Urothoe poucheti</i> , Chevreux	9, 25
1888. <i>Urothoe lachnæssa</i> , Stebbing : since called <i>Urothoides lachnæssa</i>	4, 26

The genus *Urothoe* is therefore at present composed of the following eight species:—

<i>Urothoe abbreviata</i> , Sars.	<i>Urothoe marinus</i> , Bate.
„ <i>brevicornis</i> , Bate.	„ <i>norvegica</i> , Boeck.
„ <i>elegans</i> , Bate.	„ <i>poucheti</i> , Chevreux.
„ <i>irrostratus</i> , Dana.	„ <i>pulchella</i> (Costa).

Should any reader object to finding some of the specific names masculine and others feminine, he is respectfully reminded that among the specimens examined some were males and others females.

Of the eight species enumerated, it must be observed that they are more remarkable for their likeness to one another than for any differences that can be discerned. The magnitude of the eyes and the structure of the lower antennæ vary greatly with the age and sex of the animal, the most constant feature being that the lower antennæ in the female have a two-jointed flagellum. Among the details that appear to prevail throughout the genus may be noticed the vast number of gland-cells over all parts of the body, the transparent caps to the tips of all the fingers, a peculiar spine-row on the wrist of the first gnathopods, and the long plumose setæ on the third, fourth, and fifth joints of the third peræopods, on the first joint of the fourth peræopods, and on the second segment of the pleon. The species for the most part are to be distinguished from one another only by groups of small differences. Among these, however, a single feature may here and there make itself moderately conspicuous: thus, only *Urothoe abbreviata*, Sars, is said to be blind; only *Urothoe elegans*, Sp. Bate, is described as

ornamented with rose-coloured markings¹. *Urothoe pulchella* (Costa) has the fourth joint of the third peræopods wider than in any other species. *Urothoe marinus*, Sp. Bate, alone has the rami of the first and second uropods strongly curved. *Urothoe poucheti*, Chevreux, appears to be distinguished from all other species by the greater length and stronger armature of the first uropods. *Urothoe norvegica*, Boeck, shows no very salient difference from *Urothoe elegans*, unless it may do so in colouring. *Urothoe brevicornis*, Sp. Bate, makes a near approach to *Urothoe marinus*, except in regard to its longer and straighter uropods. Dana's *Urothoe irrostratus* is the only species at present known from the Pacific. As Spence Bate has pointed out, it makes a near approach to *Urothoe elegans*; but as the figures and description are incomplete, it is not at present possible to decide whether it is identical with any European species or otherwise. The exact position of Grube's *Urothoe marinus*, var. *pectinatus*, is also doubtful.

EXPLANATION OF THE PLATES.

PLATE I.

Urothoe elegans.

The full figure is given in lateral view, the three lines above it indicating the natural size of a female, a male, and a young specimen, respectively.

a.s. Upper antenna of the male; *a.s.*, ♀, of the young.

a.i. Lower antenna of the male; *a.i.*, ♀, of the female; *a.i.*, ♀, of the young.

l.i., ♀. Lower lip of the female.

gn. 1. First gnathopod of the male.

gn. 2. Second gnathopod of the male.

prp. 1, 2, 3, 4, 5. The first, second, third, fourth, and fifth peræopods respectively, of the male.

prp. 2, ♀. Second peræopod of the young.

prp. 5, ♀. Fifth peræopod of a female; *prp.* 5, ♀, of the young.

ur. 1, 2, 3. The first, second, and third uropods respectively, of the male.

ur. 2, *ur.* 3, ♀. Second and third uropods of the female.

t. Telson of the male.

¹ Yet such markings are still visible in a specimen from Balta Sound, Shetlands, taken by the Rev. A. M. Norman in 1866, and labelled (probably for that very reason) as *Urothoe elegans*, though otherwise it does not seem to be distinguishable from *Urothoe marinus*. Hence it is doubtful whether reliance can be placed upon colouring as a distinguishing mark of *Urothoe elegans*.

PLATE II.

Urothoe marinus.

The full figure is given in lateral view, with a line above it indicating the natural size.

- a.s.* Upper antenna.
- a.i.* Lower antenna; only a part of the flagellum drawn.
- m.m.* The pair of mandibles.
- mx.* 1. First maxilla.
- mx.* 2. Second maxilla.
- m.xp.* One half of the maxillipeds, and on a larger scale the inner and outer plates of the other half.
- gn.* 1. First gnathopod.
- gn.* 2. Second gnathopod.
- prp.* 1, 2, 3, 4, 5. The first, second, third, fourth, and fifth peræopods respectively; the figure *prp.* 3 to the left showing the outer side, and the figure *prp.* 3 to the right showing the inner side of the limb.
- plp, sp.* Coupling-spines and a cleft spine of the pleopods.
- ur.* 1, 2, 3. First, second, and third uropods respectively.
- t. Telson.

PLATE III.

Urothoe brevicornis.

The full figure is given in lateral view from a small specimen, the line above it to the right indicating the natural size, the line above it to the left showing the length of a female specimen. The figures of the separate parts were all taken from the male.

- a.s.* Upper antenna.
- a.i.* Lower antenna.
- m.* Left mandible.
- l.i.* Lower lip.
- mx.* 1. First maxilla.
- gn.* 1. First gnathopod.
- gn.* 2. Second gnathopod.
- prp.* 1, 2, 3, 4, 5. First, second, third, fourth, and fifth peræopods respectively, both sides of the third peræopod being shown.
- Pl.s.* 2, *Pl.s.* 3. The lower portions respectively of the second and third segments of the pleon.
- ur.* 1, 2, 3. First, second, and third uropods respectively.
- t. Telson.

PLATE IV.

A. *Urothoe pulchella*, ♀.

or. tr. Triturating organs *in situ* in the stomach.

gn. 1. First gnathopod. *prp.* 3. Third peræopod.

gn. 2. Second gnathopod. *plp.* A pair of pleopods.

ur. 1, 2, 3. First, second, and third uropods respectively.

t. Telson upturned, and consequently viewed from the underside.

B. *Urothoe norvegica*.

gn. 1. First gnathopod. *prp.* 3. Third peræopod.

gn. 2. Second gnathopod. *plp.* A pair of pleopods.

ur. 1, 2, 3. First, second, and third uropods respectively.

t. Telson.

C. *Urothoe brevicornis*, ♀.

a.i. Lower antenna. *l.s.* Upper lip.

ur. 1, 2, 3. First, second, and third uropods respectively.

t. Telson.